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effect on October 3, to succeed Col. Samuel E. Tillman, who has been the head of the department of chemistry, mineralogy and geology since December 21, 1880, and retires for age on October 2.

THE following changes take place in the department of philosophy in the University of Michigan: Professor Alfred H. Lloyd has leave of absence for the year 1911-12. During his absence Charles Milton Perry, Ph.D. (Mich.), joins the staff as instructor in philosophy. Dr. John F. Shepard, instructor in psychology, has been advanced to an assistant professorship. An additional instructorship in psychology has been created. It will be filled by Henry Foster Adams, Ph.D. (Chicago). Harry Wolven Crane, A.B. (Mich.), at present assistant in psychology, has been elected to the George S. Morris memorial fellowship for the year 1911-12.

THE following appointments have been made at McGill University: Dr. N. H. Alcock, to the chair of physiology; Associate Professor Ernest Brown, to be professor of applied mechanics and hydraulics; H. Barton, to be professor of animal husbandry at Macdonald College. The following promotions have been made in the faculty of applied science: Mr. Batho, assistant professor of mechanics; Mr. Graham, assistant professor of mineralogy; G. M. G. Johnston, assistant professor of chemistry; H. M. Lamb, assistant professor of civil engineering; S. W. Werner, lecturer in assaying.

DISCUSSION AND CORRESPONDENCE

ACADEMIC AND INDUSTRIAL EFFICIENCY

THERE is one way in which the efficiency of industrial concerns and of educational institutions can be compared effectively, viz., in the administration of the finances.

In the following paragraphs, a number of representative educational institutions are compared to the railways of the United States as to the ratio of compensation of labor to operating expenses.

According to "Railway Statistics of the U. S. of America for the year ending June

30, 1909,"¹ the ratio of compensation of labor to operating expenses is 62.06 per cent., which, if we except one year, is the highest ratio in eleven years past.

Moreover, we might state that the usual rule for industries in general is that about 65 per cent. of operating expenses goes to labor.

In the case of the railway statistics quoted above the salaries of administrative officers, "clerks" and "all other employees" are included, as shown on page 36, and as expressly stated to the writer of this article by the compiler of the statistics.

Thus in the following statistics on educational institutions, salaries of administrative officers and all other employees, are included along with the "productive" laborers, in this case, the teachers.

And, moreover, we must remember here that while a railway administrative officer is *only* an administrator and in no wise "productive," the administrative officer of the university or college is often, and indeed, in colleges prevalently, also a teacher and thus is "productive."

Moreover, the highest salaried officers in educational institutions are in all cases "productive" whether they do actual class-room teaching or not. Presidents and deans in all colleges and universities are productive, in that they lecture a good deal, and hold numberless consultations with students which are as valuable, or more so, to the latter as are the consultations with the professors.

But the institution which pays the most to "productive" labor is the most efficient.

The following schools were selected simply because they are typical of certain kinds of schools and not because they show high efficiency in the matter under discussion. Indeed they are not higher than the average, as far as I know. Other institutions which were investigated, and which might be quoted, show practically the same ratio as those here quoted.

A number of schools showing a low ratio of

¹ Slason Thompson, Bureau of Railway News and Statistics, Chicago, 1910.

compensation of labor to operating expenses might be quoted, but that does not necessarily say anything against the educational efficiency of those schools. The teaching staff may indeed be highly efficient. It simply indicates that too much is being paid for non-essentials as over against teaching, which latter we must consider the main business of the college.

Again it must be borne in mind that in every college in the land there is included in the operating expense a considerable per cent. of money which goes to fellowships, scholarships and other "charitable" purposes, as, for example: subsidizing boarding-clubs, college papers, etc. If this money were not thus devoted to "charity" it might be spent for additional productive labor.²

Thus the seven institutions quoted show a ratio of 66.5+ per cent. compensation of labor to operating expense while the railroads show a ratio of only 62.06 per cent.

| | Year Ending | Paid to Labor | Operating Expenses | Per Cent. |
|---|----------------|---------------|--------------------|-----------|
| Throop Polytechnic Institute..... | Sept. 14, 1909 | \$ 50,000.00 | \$ 66,150.16 | 75.6 + |
| Princeton University | July 31, 1910 | 462,508.42 | 701,679.25 | 65.9 + |
| Baker University..... | July 15, 1910 | 43,801.67 | 64,637.61 | 67.7 + |
| University of Kansas..... | June 30, 1910 | 290,788.55 | 429,655.93 | 67.6 + |
| University of Okla. Howard University (federal institution) | June 30, 1910 | 93,599.81 | 125,659.08 | 74.4 + |
| Marietta College..... | June 30, 1910 | 55,450.00 | 119,574.30 | 46.3 + |
| | May 31, 1910 | 27,405.45 | 40,375.67 | 68.1 + |
| | | | Average 66.5 + | |

Moreover, less of the labor paid out of college funds is non-productive than in the case of the railroads.

And, finally, operating expense in the case of colleges includes a considerable per cent. of moneys which are devoted to "charity" by which the public profits.

C. H. HANDSCHIN

THE DIRECTOR VERSUS NEWTON

IN this case the following conversation reported by Professor Maclaurin in *SCIENCE*,

²In the University of Chicago 7.6 per cent. of operating expenses goes to fellowships and scholarships alone. A majority of the larger institutions will show a similar per cent.

XXXIII., 103, January, 1911, has just come to my notice:

Supt. Your theory of gravitation is hanging fire unduly. The director insists on a finished report, filed in his office by 9 A.M. Monday next; summarized on one page; type-written, and the main points underlined. Also a careful estimate of the cost of the research per student-hour.

Newton. But there is one difficulty that has been puzzling me for fourteen years, and I am not quite . . .

Supt. (with snap and vigor). Guess you had better overcome that difficulty by Monday morning or quit.

I have heard since that the conversation was continued as follows, and I wonder if the director was not right:

Newton. I shall continue to use my own judgment about the disposal of my time.

Supt. Yes, but no scientific man should go fourteen years, or even seven, without publishing results. Fourteen years ago you ranked among the leading thousand scientific men, but seven years ago your name was dropped, and this year it was not restored. A city that is set on a hill can not be hid.

Newton. Still I think I am right.

Supt. But the director thinks that, as long as you are accepting pay as a leading scientific man, you should *publish* enough results to keep up your reputation.

CHARLES ROBERTSON

CARLINVILLE, ILL.,
May 1, 1911

AN ENGLISH COURSE FOR ENGINEERING STUDENTS

TO THE EDITOR OF *SCIENCE*: I am not writing at present to discuss that much-discussed topic, the teaching of practical composition to engineering students, but to explain the first semester work in a course for freshman engineers given at the University of Minnesota, a two-hour course in English which goes hand in hand with a two-hour course in the more practical composition. Two authors are studied, Arnold and Huxley, the former in Gates's "Selections from Matthew Arnold," and the latter in Snell's "Autobiography and Selected Essays by Thomas Henry Huxley" in the Riverside Literature Series.